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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/505,898	02/17/2000	Kirti Dave	065733/2262	7146

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EXAMINER	
WINKLER, ULRIKE	
ART UNIT	PAPER NUMBER
1648	

DATE MAILED: 02/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/505,898	DAVE ET AL.	
	Examiner	Art Unit	
	Ulrike Winkler	1648	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *44-105* is/are pending in the application.

4a) Of the above claim(s) *48-53, 57-59, 66-71, 82-87, 93-105* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *44-47,54-56,60-65,72-81 and 88-92* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on November 20, 2003 has been entered.

Claims 44-47, 54-56, 60-65, 72-81, 88-92 are pending and are currently being examined. Claims 48-53, 57-59, 66-71, 82-87 and 93-105 are drawn to non-elected subject matter set out in the election restriction requirement of Paper No. 8 and reiterated in Paper No. 24. Applicant is herby advised that the newly added claims 93-105 are drawn to *Plasmodium* sporozoite which would have been grouped with group III in Paper No. 24. Groups II and III are subject to rejoinder upon allowance of linking claim 44. Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 93-105 drawn to a malarial antigen, specifically *Plasmodium* sporozoite, are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office Action.

Drawings

The office acknowledges the submission of the new drawings with the response submitted November 20, 2003.

Claim Rejections - 35 USC § 103

The rejection of claim 44-46, 54-56, 60-65,72-81 and 88-89 under 35 U.S.C. 103(a) over Oprandy et al. (Journal of Clinical Microbiology, 1990, see IDS #5), Huang et al. (U.S.Pat. No. 5,712,172) and WHO Bulletin (Bulletin of the World Health Organization, 1996, see IDS #5) **is withdrawn** in view of Applicant's amendments to the claims, indicating that a plurality (i.e. more than one) of detectable analyte-specific regents of arthropod-carried agents are used. The rejection has been reformulated with an additional reference below and Applicants arguments are addressed below as well.

The rejection of claim 44-46, 47, 54-56, 60-65,72-81 and 88-89 under 35 U.S.C. 103(a) as being unpatentable over Oprandy et al. (Journal of Clinical Microbiology, 1990, from applicant's IDS), Huang et al. (U.S.Pat. No. 5,712,172) and WHO Bulletin (Bulletin of the World Health Organization, 1996, see IDS #5) in view of Rattanarithikuln et al. (American Journal of Tropical Medicine, 1996, from applicant's IDS) and Sithiprasasna et al. (Annals of Tropical Medicine and Parasitology, from applicant's IDS) **is withdrawn** in view of Applicant's amendments to the claims, indicating that a plurality (i.e. more than one) of detectable analyte-specific regents of arthropod-carried agents are used. The rejection has been reformulated with an additional reference below and Applicants arguments are addressed below as well.

New Rejection in view of Applicant's amendments to the claims:

Claims 44-46, 54-56, 60-65,72-81 and 88-92 are rejected under 35 U.S.C. 103(a) over Oprandy et al. (Journal of Clinical Microbiology, 1990, see IDS #5), Huang et al. (U.S.Pat. No. 5,712,172), WHO Bulletin (Bulletin of the World Health Organization, 1996, see IDS #5) and Snowden et al. (Journal of Immunological Methods, 1991, see IDS #5).

The instant invention is drawn to a method of analyzing an arthropod sample for an agent that may cause disease in humans. The method (claim 44) contains the following steps: (a) obtaining the arthropod sample, (b) treating the sample to expose the analyte from the arthropod, (c) contacting the liquid permeable support which contains a capture reagent with the sample from the previous step (d) allowing liquid to flow through the support by capillary action, (e) detecting the presence of the analyte and (f) using a plurality of detectable analyte specific reagents for detecting arthropod carried agents. The claims contain the following additional limitations: the detection moiety, the placement of the analyte specific reagent, the arthropod is a mosquito, the liquid permeable support contains a control area, the analyte specific reagents are monoclonal antibodies, or gold and latex labeled antibodies.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

Applicant's arguments are that Oprandy et al. teaches "that the use of brittle nitrocellulose in membrane based tests is undesirable because of the possibility of high background" ...thus Oprandy teaches away from nitrocellulose-based membrane tests. In reviewing the Oprandy et al. reference, both PVDF membrane as well as a nylon membrane (see Oprandy et al., page 1701, materials and methods) were used. Applicant's indicate "Huang et al. teaches the use of nitrocellulose for the porous material to achieve adequate mechanical strength critical for providing favorable test results." Applicants are suggesting that the only porous material taught by Huang et al. is nitrocellulsoe, this is not the case. Although the references exemplifies the use nitrocellulose membrane, reference indicates that many materials such cellulose, glass fiber and nylon are contemplated as the propos membrane (see Huang et al., U.S. Pat. No. 5,712,172, column 5, lines 11-24). The Oprandy et al. reference does not indicate that nitrocellulose as the porous material does not function.

Applicant's arguments are that non-preferred embodiments cannot be used to make a 35 U.S.C. 103 obvious type rejection. The court has not found this to be the case, see *In re Lamerti and Konort* 192 USPQ 278, 280 (CCPA 1976), "....is taught to be preferred is not controlling, since all disclosures of the prior art, including unpreferred embodiments must be considered."

In re Gurley (CA FC) 31 USPQ2d 1130 (cited by Applicant)

> Page 1131: Referring to the statement of inferiority in the Yamaguchi reference, Mr. Gurley argues that Yamaguchi "teaches away" from Gurley's invention. A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant. The degree of teaching away will of course depend on the particular facts; in general, a reference will teach away if it suggests that the line of development flowing from the reference's disclosure is unlikely to be productive of the result sought by the applicant. *See United States v. Adams* , 383 U.S. 39, 52, 148 USPQ 479, 484 (1966)

> Page 1132: Gurley's position appears to be that a reference that "teaches away" can not serve to create a *prima facie* case of obviousness. We agree that this is a useful general rule. However, such a rule cannot be adopted in the abstract, for it may not be applicable in all factual circumstances. Although a reference that teaches away is a significant factor to be considered in determining unobviousness, the nature of the teaching is highly relevant, and must be weighed in substance. A known or obvious composition does not become patentable simply because it has been described as somewhat inferior to some other product for the same use.

In re Lamerti and Konort and *In re Gurley* both indicate that the use of a non-preferred embodiment in the prior art does not render the product unobvious. Applicant's invention is claiming the use of antibodies to detect disease agents in an arthropod sample using a device, such as a dipstick, which can be made up of nitrocellulose or any other porous material.

Oprandy et al. indicates that nitrocellulose is a functional substance in a membrane-based test, the reference does not indicate that the membrane cannot be used. Oprandy et al. teach a dot-blot immunobinding assay to detect arthropod-borne agents. The method includes isolating the sporozoite from the mosquito, treating the sporozoite with a detergent to expose the analyte (see materials and methods). Alternately, sporozoite containing mosquitoes were homogenized together in the presence of detergent before spotting onto the filter. An antibody to detect the circumsporozoite protein was used to assay for the presence of the etiologic agent (see figure 2). The titration of the arthropod vector with SDS liberates the antigen. The reference also teaches that this same technique can be used for other arthropod –vectored etiologic agents (see page 1703, column 2, last paragraph). The reference does not apply the sample to a dipstick device for the detection of the analyte.

Huang et al. teach the use of a lateral flow device for the detection of an analyte in a single step. The reference does not limit the material to nitrocellulose and can be any material that allows lateral flow (see column 5, lines 12-23). Capillary flow is the result of surface

tension. It is the surface tension that moves water through the material; this is regardless of the positioning of the device vertical/horizontal as the water will move from the wetted area to the dry area by way of wicking action. The Huang et al. device contains a sample receiving region which is in direct contact with the liquid sample that contains the analyte, a separate analyte detection region and an end flow region all made of porous material which wicks the liquid through the analyte detection region (see Huang et al. claim 1). The analyte detection region includes labeling reagents, a capture reagent and a control reagent also an antibody. Therefore the reference teaches using more than one analyte specific reagent (meeting the plurality limitation of the instant claims). The device can be used for the detection of analytes directly from a biological sample. The reference teaches a method of setting up the test strip, using the appropriate controls and utilizing colored detection agent. The physical construction of the device is the same as the instantly claimed dipstick. The reference also teaches the various detection moieties that can be used with the analyte detection reagent. The reference does not teach detecting an etiologic agent from a mosquito sample.

WHO Bulletin teaches a dipstick assay for the detection of a malarial antigen found in the blood of an infected patient. Here the following steps are used: a blood sample is collected, then the blood is mixed with a lysing agent, the dipstick is placed vertically in the sample and the sample is rapidly taken up by capillary action, a detection agent is then added to sample well, the dipstick is washed and the dipstick is analyzed for the presence of a positive reaction (see figure 1 and page 48 column 2, last paragraph). The dipstick construction contains a reagent control as well. The method steps do not require a prefiltration step of the sample to remove cell debris from the whole blood lysates. The reference teaches the detection of a blood stage malarial

antigen, the reference does not teach the detection of a mosquito stage antigen from a mosquito sample.

Snowden et al. teaches that antibodies used in an ELISA setting can be readily adapted to a dipstick assay, to produce a dipstick test that can detect multiple antigens (see abstract and page 64, column 2). The dipstick assay has the advantage that two or more antigens may be tested at the same time. In this case the assay tested for human or chicken blood from a mosquito that has had a recent blood meal. The dipstick can be made from a variety of materials including nitrocellulose, nylon or PVFD (see page 59, column2). The reference does not teach specific arthropod carried agents.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the analyte detection reagents as taught by Oprandy et al. and apply them to the device taught by Huang et al., the WHO bulletin and Snowden et al. One having ordinary skill in the art would have been motivated to do this because in order to determine the risk of arthropod-vector disease spread it is necessary to survey the insect population for these etiologic agent. This information is important to assess the efficacy of insect control and abatement programs. One having ordinary skill in the art would have a high expectation of success in applying the antibodies and the methods of exposing the analyte using detergents as taught by Oprandy et al. and formulate them into the device as taught by Huang et al., the WHO Bulletin and Snowden et al. Snowden et al. clearly teaches that reagents used for an ELISA based test are predictably adaptable to the dipstick protocol. In the experiments comparing blood meal analysis of mosquito using the dipstick assay and ELISA showed 100% agreement and 100% accuracy

(see Snowden et al., page 58, last paragraph). Therefore, the instant invention is obvious over Oprandy et al., Huang et al., the WHO Bulletin and Snowden et al.

Claims 44-46, 47, 54-56, 60-65,72-81 and 88-92 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oprandy et al. (Journal of Clinical Microbiology, 1990, from applicant's IDS), Huang et al. (U.S.Pat. No. 5,712,172), WHO Bulletin (Bulletin of the World Health Organization, 1996, see IDS #5) and Snowden et al. (Journal of Immunological Methods, 1991, see IDS #5) in view of Rattanarithikuln et al. (American Journal of Tropical Medicine, 1996, from applicant's IDS) and Sithiprasasna et al. (Annals of Tropical Medicine and Parasitology, from applicant's IDS) **is maintained** for reason of record.

Applicant's arguments and the Office's response are essentially the same as those set out in the above rejection. Applicant further argues that neither Rattanarithikuln et al. or Sithiprasasna et al. teach or motivate the selection of monoclonal antibodies for the detection of arthropod-borne disease vectors. This is not found convincing because Rattanarithikuln et al. teach using monoclonal antibodies in ELISA detection assay (see page 116, 3rd paragraph). Sithiprasasna et al. teach using monoclonal antibodies for the detection of Dengue virus a flavivirus (see page 399, column 1). The addition of a panel assay in the newly added claims does not provide a contribution over the prior art. It is obvious from the prior art that Rattanarithikuln et al. disclosed that they used two different monoclonal antibodies in an ELISA assay to differentiate whether the misquotes carries *P. vivax* or *P. falciparum.* Merely changing the format of an assay (vertical v. horizontal or PVDF v nitrocellulose) that depends on the same unique interaction between an antibody and the antigen for its functions does not distinguish the

instant invention over the prior art. Snowden et al. clearly teaches that reagents used for an ELISA based test are predictably adaptable to the dipstick protocol. In the experiments comparing blood meal analysis of mosquito using the dipstick assay and ELISA showed 100% agreement and 100% accuracy (see Snowden et al., page 58, last paragraph). Snowden et al. also teaches that the dipstick assay has the advantage that two or more antigens may be tested at the same time, indicating the efficiency of the assay method. Therefore, the instant invention is obvious over Oprandy et al., Huang et al., WHO Bulletin and Snowden et al. in view of Rattanarithikuln et al. and Sithiprasasna et al.

Conclusion

No claims allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ulrike Winkler, Ph.D. whose telephone number is 571-272-0912. The examiner can normally be reached M-F, 8:30 am - 5 pm. The examiner can also be reached via email [ulrike.winkler@uspto.gov].

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Housel, can be reached at 571-272-0902.

The official fax phone number for the organization where this application or proceeding is assigned is 703-872-9306; for informal communications please the fax phone number will change to 571-273-0912

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0196.

ULRIKE WINKLER, PHD.
PATENT EXAMINER

2/9/04